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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,255	02/13/2002	Tetsuya Miwa	2635-92	6787
23117	7590	05/09/2005	EXAMINER	
NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714			MOHANTY, BIBHU R	
		ART UNIT	PAPER NUMBER	
		3747		

DATE MAILED: 05/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/073,255	MIWA TETSUYA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Bibhu Mohanty	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 03 February 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,2,8-13 and 19-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 23-32 is/are allowed.
- 6) Claim(s) 1,2,8-13,19-22 and 33-38 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____.   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____.                                   |

## DETAILED ACTION

1. Applicants request for an RCE was received on 2-3-05. Based the prior art reference provided on the PTO-1449 the allowance of the claim 1-2, 8-13, 19-39 is now withdrawn. A new rejection on the merits follows.

A review of the application shows multiple embodiments and species are presented. Applicant is reminded that an restriction or election of species requirement may be made at any time during prosecution, though one is not made at this time.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 8-13, 19-22, 33-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al US Patent 5,514,929.

Kawamura et al have disclosed the invention substantially as claimed showing an earth electrode protrusion (14), a gap (G) between the center electrode protrusion (18), and an inductive energy of between approximately 15-34 mJ (see Fig. 3). The gap (G) between the protrusions is .3-.5 mm. However, Kawamura does not specifically show an embodiment with an earth electrode protrusion less than 2.3mm in diameter, of less than 1.1mm in diameter, or having an area of 4.2 mm squared (the diameter of the earth electrode is not explicitly given in the Kawamura reference).

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However, Kawamura further discloses in Fig. 4 that by decreasing the diameter of a protrusion in a spark plug the air-fuel ratio is reduced. Further, the Examiner takes Official Notice that it is well known in a variety of arts that reducing bar's diameter will lower costs by requiring less material.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kawamura et al to have an earth electrode protrusion smaller than 2.3 mm in diameter (or an area of 4.2 mm squared) to reduce the air-fuel ratio as suggested by Kawamura and to reduce costs as known in the art.

With regard to claims 2, 13, 24, it would be obvious to vary the ignition energy to any desired value to meet the required value for combustion. The claimed value of 32W is considered to fall within the normal range for a spark plug's ignition energy.

With regard to claims 8, 9, 19, 20, 27, it would be obvious to increase the spark gap to .7mm or any appropriate desired value, if it was desired to reduce the ignition energy based on desired combustion characteristics.

With regard to claim 9, 20, the use of an ignition coil of 22mm or less in diameter is considered to be within the normal range of ignition coil use in a spark plug.

With regard to claims 10, 21, 35-38, the particular claimed metals are considered known conductors suitable for use in electronic applications to provide good conductivity.

3. Claims 23-32 are allowable over the prior art of record.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bibhu Mohanty whose telephone number is 571 272-4851. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Yuen can be reached on 703 272-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Bibhu Mohanty  
Primary Examiner  
Art Unit 3747

brm